ABBREVIATIONS

Abbreviation	Description
A/E	ARCHITECT / ENGINEER
AAHX	AIR TO AIR HEAT EXCHANGER
AB	AIR BLENDER
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCH	AIR COOLED CHILLER
ACCU	AIR-COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
ACD	AUTOMATIC CONTROL DAMPER,MODULATING
ACD-TP	AUTOMATIC CONTROL DAMPER,TWO POSITION
AD	ACCESS DOOR
AF	AFTER FILTER
AFCV	AIR FLOW CONTROL VALVE
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOW MEASURING DEVICE
AFW	AIR FOIL WHEEL (FAN)
AHU	AIR-HANDLING UNIT
AMP	AMPERGE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW	AIR WASHER
AXF	AXIAL FLOW
B	BOILER
BD	BUTTERFLY DAMPER
BDD	BACKDRAFT DAMPER
BDR	BASE BOARD RADIATOR
BFP	BACKFLOW PREVENTER
BFT	BOILER PLANT FIRE TUBE
BG	BOTTOM GRILLE
BHP	BRAKE HORSEPOWER
BHW	HOT WATER HEATING BOILER
BHX	BOILER BLOWDOWN HEAT EXCHANGER
BIW	BACKWARD INCLINED WHEEL (FAN)
BMT	BONE MARROW TRANSPLANT
BR	BOTTOM REGISTER
BSC	BIOLOGICAL SAFETY CABINETS
BT	BLOWOFF TANK
BTC	BLOWOFF TANK CONTROL VALVE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BWT	BOILER PLANT WATER TUBE
C	CENTIGRADE (CELCIUS)
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
CD	CEILING DIFFUSER
CENT	CENTRIFICAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CFP	CHEMICAL FEED PUMP
CG	CEILING GRILLE
CH	CHILLER
CHP	CHILLED WATER PUMP
CHW	CHILLER WATER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CI	CAST IRON
CM	CARBON MONOXIDE
CM	CUBIC METER
CM/S	CUBIC METER PER SECOND
CO	CLEAN OUT
CO2	CARBON DIOXODE
COMP	COMPRESSOR UNIT
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CR	CEILING REGISTER
CS	CONDENSATE STORAGE TANK
CSG	CLEAN STEAM GENERATOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CW	COLD WATER (POTABLE)
CWCC	CHILLED WATER COOLING COIL
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN (TO COOLING TOWER)
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)
D	DAMPER - AUTOMATIC
D-1	OUTDOOR AIR DAMPER
D-2	RETURN AIR DAMPER
D-3	RELIEF AIR DAMPER
DB	DECIBELS
Db	DRY-BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DF	DIFFUSER
DIA	DIAMETER
DIW	DEIONIZED WATER
DP	DEW POINT TEMPERATURE
DP	DIFFUSER PLATE
DPA	DIFFERENTIAL PRESSURE ASSEMBLY
DPS	DIFFERENTIAL PRESSURE SENSOR
DX	DIRECT EXPANSION
DXCC	DIRECT EXPANSION COOLING COIL
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EVAPORATIVE COOLER
ECC	ENGINEERING CONTROL CENTER
ECU	EVAPORATIVE CONDENSER UNIT
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EGS	EMERGENCY GAS SHUTOFF
EGT	ENTERING GLYCOL TEMPERATURE
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
EMD	END OF MAIN DRIP (STEAM)
ENT	ENTERING
ER	EXHAUST REGISTER
ERC	ELECTRIC REHEAT COIL
ERP	ELECTRIC RADIANT PANEL
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETO	ETHYLENE OXIDE
EUH	ELECTRIC UNIT HEATER
EWC	EVAPORATIVE WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX.	EXISTING
F	FAHRENHEIT
F&T	FLOAT AND THERMOSTATIC
F/SDPR	COMBINATION FIRE SMOKE DAMPER
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT (4 PIPE)
FCUC	FAN COIL UNIT COOLING ONLY
FCUH	FAN COIL UNIT HEATING ONLY
FCW	FORWARD CURVED WHEEL (FAN)
FD	FLOOR DRAIN
FD	FIRE DAMPER
FF	FINAL FILTER
FHX	FLUE GAS/FEEDWATER HEAT EXCHANGER
FM	FLOW METER
FOP	FUEL OIL PUMP
FOT	FUEL OIL TANK
FOHX	FUEL OIL HEAT EXCHANGER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPTU	FAN POWERED TERMINAL UNIT
FR	FLOOR REGISTER
FRP	FIBER REINFORCED POLYESTER
FS	FLOW SWITCH
FSTAT	FREEZESTAT
FT	FEET
FT-LB	FOOT-POUND
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLONS
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GS	GALVANIZED STEEL
H	HUMIDIFER
H&CW	HOT & COLD WATER
HAC	HOUSEKEEPING AID CLOSET
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HD	HOOD
HOA	HAND/OFF/AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HPDT	HIGH PRESSURE DRIP TRAP
HPR	HIGH PRESSURE RETURN (STEAM CONDENSATE)
HPS	HIGH PRESSURE SUPPLY (STEAM)
HRC	HEAT RECOVERY COIL
HRD	HEAT RECOVERY DEVICE
HRP	HYDRONIC RADIANT (CEILING) PANEL
HRW	HEAT RECOVERY WHEEL
HSTAT	HUMIDISTAT
HTM	HUMIDIFIER TERMINAL
HUM	HUMIDIFIER UNIT MOUNTED
HVU	HEATING AND VENTILATING UNIT
HW	HOT WATER
HWC	HOT WATER COIL
HWHC	HOT WATER HEATING COIL
HWP	HEATING HOT WATER PUMP
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HWUH	HOT WATER UNIT HEATER
HVD	HOISTWAY VENT DAMPER
HX	HEAT EXCHANGER
HZ	HERTZ
I/O	INPUT/OUTPUT
IAQ	INDOOR AIR QUALITY
IBT	INVERTED BUCKET TRAP
ICF	IN-LINE CENTRIFUGAL FAN
ICU	INTENSIVE CARE UNIT
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE AND BYPASS
IN	INCHES
IN HG	INCHES OF MERCURY
IN WC	INCH WATER COLUMN
IN WG	INCH WATER GAUGE
IN-LB	INCH-POUND
IPLV	INTERGRATED PART LOAD VALUE
IRH	INTRARED HEATER
IS	INSECT SCREEN
IU	INDUCTION UNIT
IV	INLET VANES
kg	KILOGRAM
kg/HR	KILOGRAM PER HOUR
kPa	KILOPASCAL
kW	KILOWATT
kWh	KILOWATT HOUR
L	LITER
L/h	LITERS PER HOUR
L/m	LITERS PER MINUTE
L/s	LITERS PER SECOND
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT (FEET)
LGT	LEAVING GLYCOL TEMPERATURE
LH	LATENT HEAT
LPG	LIQUID PROPANE GAS
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
LLHX	LIQUID TO LIQUID HEAT EXCHANGER
LPS	LOW PRESSURE STEAM
LPSC	LOW PRESSURE STEAM (CLEAN)
LSD	LINEAR SLOT DIFFUSER
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LVG	LEAVING
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
M	METER, SI UNIT
M/s	METERS PER SECOND (OR METERS/SECOND)
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MB	MIXING BOX
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MER	MECHANICAL EQUIPMENT ROOM
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MH	MANHOLE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MM	MILLIMETER
MOV	MOTOR OPERATED VALVE
MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
MPS	MEDIUM PRESSURE STEAM
MRI	MAGNETIC RESONANCE IMAGING
MTD	MEAN TEMPERATURE DIFFERENCE
MVD	MANUAL VOLUME DAMPER
MZ	MULTI-ZONE
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NG	NATURAL GAS
NGFM	NATURAL GAS FLOWMETER
NO	NORMALLY OPEN
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NOM	NOMINAL
NPLV	NON-STANDARD PART LOAD VALUE
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAG	OUTSIDE AIR GRILLE
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
OFM	OIL FLOWMETER
OR	OPERATING ROOM
P	PUMP
PA	PASCAL
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT (FEET)
PD	PRESSURE DROP
PEF	PROPELLER (TYPE) EXHAUST FAN
PF	PRE-FILTER
PG	PRESSURE GAGE
PGW	PROPYLENE GLYCOL-WATER (SOLUTION)
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PRS	PRESSURE REGULATING (VALVE) STATION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH – ABSOLUTE
PSIG	POUNDS PER SQUARE INCH – GAGE
PSS	PRIMARY SECONDARY SYSTEM
PSV	PRESSURE SAFETY VALVE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
R/E	RETURN OR EXHAUST
RA	RETURN AIR
RAD	REFRIGERANT AIR DRYER
RAF	RADIO FREQUENCY
RAHX	ROTARY AIR HEAT EXCHANGER
RAT	RETURN AIR TEMPERATURE
RCCH	REMOTE CONDENSER CHILLER
RCU	RECIPROCATING CHILLER UNIT
RD	REFRIGERANT DISCHARGE
RDS	ROOM DATA SHEETS
REA	RELIEF AIR
RF	RETURN FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID LINE
RLA	RUN LOAD AMPERE
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RV	RELIEF VALVE
SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SAT	SUPPLY AIR TEMPERATURE
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCI	SPINAL CODE INJURY
SCR	SILICON CONTROLLED RECTIFIER
SD	SMOKE DETECTOR
SD	SUPPLY AIR DIFFUSER
SDPR	SMOKE DAMPER
SDR	SMOKE DAMPER (RETURN)
SDS	SMOKE DAMPER (SUPPLY)
SEN	SENSIBLE HEAT
SF	SUPPLY FAN
SG	SUPPLY AIR GRILLE
SH	STEAM HUMIDIFIER
SHC	STEAM HEATING COIL
SI	SQUARE INCHES
SP	STATIC PRESSURE
SP GR	SPECIFIC GRAVITY
SPD	SUPPLY PROCESS AND DISTRIBUTION
SPRV	STEAM PRESSURE REDUCING VALVE
SPS	STATIC PRESSURE SENSOR
SQ FT	SQUARE FOOT (FEET)
SR	SUPPLY AIR REGISTER
SS	STAINLESS STEEL
SSHX	STEAM TO STEAM HEAT EXCHANGER
SSR	SOLID SEPARATOR
ST	STEAM TRAP
SUH	STEAM UNIT HEATER
SV	STEAM PRESSURE REDUCING VALVE
SVS	STEAM VENT SILENCER
SWHX	STEAM TO WATER HEAT EXCHANGER
T & PCV	TEMPERATURE AND PRESSURE CONTROL VALVE
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TDS	TOTAL DISSOLVED SOLIDS
TG	TRANSFER GRILLE
TP	TRAP
TR	TOP REGISTER
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
TWU	THRU-WALL UNIT
UC	UNDER CUT
UC	UNIT COOLER
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
URV	UPBLAST UNIT VENTILATOR
V	VALVE
VAF	VANE-AXIAL FAN
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VHA	VETERANS HEALTH ADMINISTRATION
VI	VIBRATION ISOLATOR
VIV	VARIABLE INLET VANES
VP	VACUUM PUMP
VPS	VARIABLE PRIMARY SYSTEM
VR	VACUUM (STEAM CONDENSATE) RETURN
VSD	VARIABLE SPEED DRIVE
VUH	VERTICAL UNIT HEATER
W	WATTS
WAG	WASTE ANETHESIA GAS
Wb	WET-BULB (TEMPERATURE)
WC	WATER COOLED
WCCH	WATER COOLED CHILLER
WCCU	WATER COOLED CONDENSING UNIT
WCHP	WATER COOLED HEAT PUMPS
WCPU	WATER COOLED PACKAGED UNIT
WEF	WALL EXHAUST FAN
WF	WATER FILTER
WFCV	WATER FLOW CONTROL VALVE
WFM	WATER FLOWMETER
WFMD	WATER FLOW MEASURING DEVICE
WG	WATER GAGE
WPD	WATER SIDE PRESSURE DROP
YR	YEAR

MECHANICAL GENERAL NOTES AND SPECIFICATIONS

1 ALL WORK SHALL CONFORM TO ALL LOCAL, STATE, AND NATIONAL CODES ALONG WITH ALL VA STANDARDS. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS.

2 THE MECHANICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND INSPECTIONS REQUIRED FOR HIS WORK.

3 ALL MATERIALS, EQUIPMENT AND PRODUCTS INCORPORATED IN THE WORK UNDER THE CONTRACT SHALL BE NEW, OF A SUITABLE GRADE FOR THE PURPOSES INTENDED, AND TO THE EXTENT POSSIBLE, STANDARD PRODUCTS OF THE VARIOUS MANUFACTURERS EXCEPT WHERE SPECIAL CONSTRUCTION OR PERFORMANCE FEATURES ARE CALLED FOR.

4 ANY EQUIPMENT OR MATERIAL DEVIATIONS FROM THAT SPECIFIED OR DETAILED ON THIS DRAWING SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER. ALL PROPOSED EQUIPMENT DEVIATIONS SUBMITTED SHALL BE SIMILAR BOTH IN QUALITY AND CAPACITY TO THAT EQUIPMENT SPECIFIED.

5 ALL MECHANICAL EQUIPMENT SHALL BE LISTED AND LABELED BY UNDERWRITERS LABORATORIES (U.L.).

6 THE MECHANICAL CONTRACTOR SHALL INSTALL EQUIPMENT AS SHOWN ON THE DRAWINGS ALLOWING FOR SUFFICIENT ACCESS AND CLEARANCE SPACE FOR EQUIPMENT MAINTENANCE, REPAIRS AND REPLACEMENT. PROVIDE PROPER CLEARANCES FOR REQUIRED PIPING AND ELECTRICAL SERVICES AND CONNECTIONS. INSTALL ALL EQUIPMENT WITH REQUIRED ACCESS AND CLEARANCES IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS AND/OR WITH ALL APPLICABLE CODES AND STANDARDS.

7 THE MECHANICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION AND ROUTING OF ALL PROPOSED DUCTWORK, PIPING AND EQUIPMENT WITHIN THE BUILDING STRUCTURE.

8 THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL HIS OWN SUPPORT EQUIPMENT. LOCATIONS SHALL BE COORDINATED WITH ALL CONTRACTORS PRIOR TO INSTALLATION.

9 THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER CONNECTIONS TO THE EQUIPMENT PROVIDED UNDER THIS CONTRACT.

10 THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONTROL WIRING FOR HIS EQUIPMENT.

11 DUCTWORK AND PIPING LAYOUTS AND LOCATIONS ARE SCHEMATIC. DO NOT SCALE THESE DRAWINGS. EXACT ROUTING OF DUCTWORK AND PIPING MUST BE DETERMINED IN THE FIELD. ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR BY ACTUAL MEASUREMENT AND OBSERVATION BEFORE ORDERING OR FABRICATING ANY DUCTWORK, PIPING OR EQUIPMENT. ANY DISCREPANCIES BETWEEN THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND THE EXISTING CONDITIONS OR DIMENSIONS SHALL BE REPORTED TO THE A/E AND VMAC COTR BEFORE THE PERFORMANCE OF ANY WORK. FAILURE TO VERIFY AND REPORT SHALL CONSTITUTE THE CONTRACTOR'S ACCEPTANCE OF THE EXISTING CONDITIONS AS FIT FOR THE PROPER EXECUTION OF HIS WORK. SEE ARCHITECTURAL DRAWINGS FOR FINAL LOCATION OF CEILING INSTALLED.

12 DUCTWORK AND PIPING SHALL BE KEPT AS CLOSE AND HIGH AS POSSIBLE TO THE BUILDING WALLS, CEILING AND FLOOR AND ROOF STRUCTURE IN ORDER THAT THE MAXIMUM AMOUNT OF SPACE IS AVAILABLE. ADDITIONAL OFFSETS, FITTINGS, ETC. NOT SHOWN BUT REQUIRED TO MAINTAIN MAXIMUM CLEARANCE SHALL BE PROVIDED AT NO ADDITIONAL COST,

13 THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PATCHING, PAINTING AND CLEANING ASSOCIATED WITH THIS PROJECT UNLESS NOTED OTHERWISE.

14 PROVIDE A COMPLETE 1-YEAR WARRANTY ON ALL LABOR AND MATERIALS.

15 CONTRACTOR SHALL FURNISH A BOUND SET OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT TO THE OWNER UPON COMPLETION OF PROJECT.

16 INSTALL ESCUTCHEONS IN ALL PLACES WHERE PIPING PENETRATES A WALL IN AN EXPOSED LOCATION.

17 THE MECHANICAL CONTRACTOR SHALL MAKE A COMPLETE REVIEW OF THE MECHANICAL PLANS, INCLUDING THE SCHEDULES AND DETAILS PRIOR TO INSTALLATION OF ANY MECHANICAL SYSTEMS AND SHALL RESOLVE ANY CONFLICTS WITH THE ENGINEER.

18 DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE. INSTALL PIPING FREE OF SAGS AND BENDS. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION

19 THE MECHANICAL CONTRACTOR SHALL TAKE THE LEAD IN PREPARATION OF COORDINATION DRAWINGS. SUCH DRAWINGS SHALL BE COMPLETED WITH COORDINATION FROM THE GENERAL CONTRACTOR AND ALL OTHER MAJOR AND MINOR SUBCONTRACTORS. PROVIDE PLAN VIEWS, SECTIONS AND ELEVATIONS, AS REQUIRED, TO FULLY COORDINATE ALL NEW WORK WITH ITSELF AND EXISTING CONDITIONS. DRAWINGS SHALL SHOW, BUT NOT BE LIMITED TO, ALL DUCTWORK, AIR DISTRIBUTION, MECHANICAL EQUIPMENT, MECHANICAL PIPING, FIRE PROTECTION PIPING, PLUMBING PIPING, CABLE TRAYS, LIGHTING FIXTURES, CEILING GRID AND HEIGHT, BEAMS AND JOISTS (WITH ELEVATIONS MARKED), ELECTRICAL CONDUIT LARGER THAN 2 INCHES IN DIAMETER AND ANY OTHER CEILING MOUNT DEVICES OR EQUIPMENT THAT PROTRUDE INTO THE CEILING CAVITY. IF THERE ARE ANY OUTSTANDING ISSUES THAT CANNOT BE RESOLVED, CONSULT WITH ARCHITECT AND/OR ENGINEER (THROUGH THE VA COTR) FOR GUIDANCE AND MAKE CORRECTIONS IN ACCORDANCE WITH DIRECTIONS GIVEN. IT IS IMPORTANT TO NOTE THAT FABRICATION CANNOT BEGIN UNTIL COORDINATION DRAWINGS HAVE BEEN APPROVED. ANY INSTALLATION COMMENCED PRIOR TO APPROVAL IS TAKEN AT THE CONTRACTORS OWN RISK AND MAY HAVE TO BE MODIFIED, MOVED AND/OR RECONFIGURED AT CONTRACTORS COST.

HVAC DESIGN DATA

DESIGN CONDITIONS	SUMMER			WINTER			LOWEST AVERAGE ANNUAL DEWPOINT
	TEMP	WET BULB TEMP	% HUMIDITY	TEMP	DEWPOINT TEMP	% HUMIDITY	
OUTDOOR DESIGN CONDITIONS	96.8 °F	76.6 °F	40.3	29.1 °F	9.6 °F	39%	-3 °F
ELECTRICAL ROOM	86.0 °F			40.0 °F			
SECURITY/IT	80.0 °F						
STORAGE							
ELEVATOR HOISTWAY	104.0 °F			32.0 °F			
ELEVATOR MACHINE ROOM	77.0 °F			50.0 °F			

DEDUCT ALTERNATES

1. DEDUCT 1
   a. REMOVE ELEVATOR #2 CAB AND EQUIPMENT. ELEVATOR HOIST WAY TO REMAIN.
   b. REMOVE CAR/PARKING COUNT SYSTEM
   c. REMOVE STOREFRONT FROM STAIR SHAFTS
2. DEDUCT 2 - AREA DEDUCT #1
   a. DEDUCT LEVEL 4 PRECAST CONCRETE STRUCTURE AND ASSOCIATE ITEMS TO COLUMN LINE 7.
   b. REDUCE STAIR AND ELEVATOR TOWER 1 LEVEL
3. DEDUCT 3 - AREA DEDUCT #2
   a. DEDUCT LEVEL 4 PRECAST CONCRETE STRUCTURE AND ASSOCIATE ITEMS FROM COLUMN LINE 7 TO LEVEL 3 RAMP COLUMN LINE 3.
   b. REDUCE NORTH STAIR TOWER 1 LEVEL.
   c. REMOVE SILANE SEALER ON ALL LEVELS.

C:\Users\oruizdiaz\Documents\14-188-Mech-Plumb_oruizdiaz.rvt

Revisions: | Date

VA | U.S. Department of Veterans Affairs

Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037960 DORELL J. ROYSTER 10/16/15

ARCHITECT/ENGINEERS:

PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer
APOGEE CONSULTING GROUP, PA
1151 Kildare Farm Road, Suite 120,
Cary, NC 27511
T: 919.858.7420

Elec Engineer
CMTA CONSULTING ENGINEERS
1610 Woodstead Court, Suite 105
Woodlands, TX 77380
T: 281.419.9899

Civil Engineer
H2B Inc..
1225 North Loop West,Suite 900
Houston, TX 77008
T: 713.864.2900

Functional Design
CARL WALKER INC.
2801 Network Blvd., Suite 101
Frisco, TX 75034
T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

Drawing Title: MECHANICAL NOTES, ABBREVIATIONS, AND LEGEND

Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER

Project Title: BUILD PARKING GARAGE A

Location: Michael E. DeBakey VAMC, Houston, TX

Date: 2015/10/16 | Checked By: DJR | Drawn By: ORD

Apogee Project #: 14-188

Building Number: 123

Drawing Number: MI001

OFFICE OF FACILITIES MANAGEMENT

VA Project Number: 580-321

VA | U.S. Department of Veterans Affairs

LOUVER SCHEDULE

TAG	LOCATION	AREA AND/OR ROOM SERVED	SIZE	AIRFLOW	APD	MOUNTING	APPLICATION	TYPE	REMARKS
L-1	102	STORAGE 106	16X8	50 CFM	0.02 in-wg	WALL	INTAKE	BRICK VENT	1

REMARKS:
1. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATION.

FAN SCHEDULE

TAG	LOCATION	AIRFLOW	TSP	DRIVE	HP (W)	PHASE	VOLT	R.P.M.	SPEED CONTROL	SONES	REMARKS
EF-1	CEILING	50 CFM	0.119 in-wg	DIRECT	46 W	1	115	1680	YES	3.0	1,3,5,6
EF-2	WALL	500 CFM	0.224 in-wg	DIRECT	0.5 HP	1	115	1550	YES	7.2	1,2,4,5,6

REMARKS:
1. CEILING TYPE WITH INTEGRAL GRILLE
2. CENTRIFUGAL SIDE WALL
3. WITH OCCUPANCY SENSOR
4. WITH REVERSE THERMOSTAT SET TO 80 DEGREES
5. WITH MOTOR RATED SWITCH
6. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATION.

FAN COIL UNIT SCHEDULE

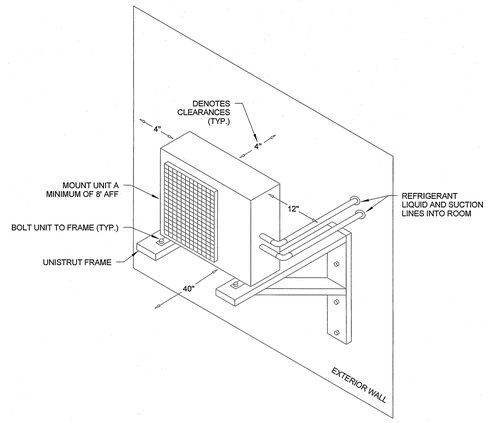
MARK	LOCATION	AREA AND/OR ROOM SERVED	TYPE	AIRFLOW	TOTAL COOLING CAPACITY	SENSIBLE CAPACITY	HEATING CAPACITY	EAT DB	ELECTRICAL DATA	MCA	MOCP	VOLT	REMARKS
FCU-1	ELEC 103	ELEC 103	WALL MOUNTED	370 CFM	12000.0 Btu/h	9720.0 Btu/h	N/A	75 °F	208/230, 1, 60	POWER FROM OUTDOOR UNIT			1,2
FCU-2	IT 104	IT 104	WALL MOUNTED	370 CFM	12000.0 Btu/h	9720.0 Btu/h	N/A	75 °F	208/230, 1, 60	POWER FROM OUTDOOR UNIT			1,2
FCU-3	SECURITY 105	SECURITY 105	WALL MOUNTED	370 CFM	12000.0 Btu/h	9720.0 Btu/h	N/A	75 °F	208/230, 1, 60	POWER FROM OUTDOOR UNIT			1,2
FCU-4	ELEV CNTRL RM 203	SECURITY 105	WALL MOUNTED	370 CFM	12000.0 Btu/h	9720.0 Btu/h	N/A	75 °F	208/230, 1, 60	POWER FROM OUTDOOR UNIT			1,2

REMARKS:
1. WITH MANUFACTURER'S COASTAL ENVIRONMENT CORROSION PROTECTION FINISHES.
2. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATION.

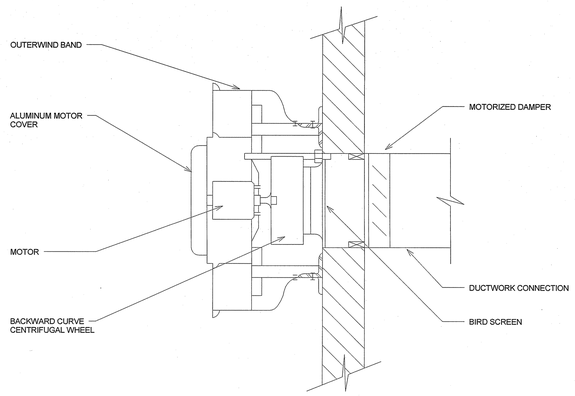
CONDENSING UNIT SCHEDULE

TAG	LOCATION	AREA AND/OR ROOM SERVED	COOLING CAPACITY RANGE (BTU)	HEATING CAPACITY	COMPRESSOR TYPE	POWER	MCA	MOCP	REMARKS
CU-1	OUTSIDE ELEC 103	ELEC 103	12000	N/A	DC INVERTER-DRIVEN TWIN ROTARY	208/230, 1, 60	13	15	1
CU-2	OUTSIDE IT 104	IT 104	12000	N/A	DC INVERTER-DRIVEN TWIN ROTARY	208/230, 1, 60	13	15	1
CU-3	OUTSIDE SECURITY 105	SECURITY 105	12000	N/A	DC INVERTER-DRIVEN TWIN ROTARY	208/230, 1, 60	13	15	1
CU-4	OUTSIDE ELEV CNTRL RM 203	ELEV CNTRL RM 203	12000	N/A	DC INVERTER-DRIVEN TWIN ROTARY	208/230, 1, 60	13	15	1

REMARKS:
1. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATION.



3 MH401 CONDENSING UNIT INSTALLATION DETAIL
N.T.S.



4 MH401 CENTRIFUGAL WALL EXHAUST FAN
N.T.S.

ZONE TEMPERATURE MONITORING:

ZONE TEMPERATURE SENSOR MONITORS ROOM TEMPERATURE AND TRIGGERS AN ALARM FOR EITHER HIGH OR LOW ROOM TEMPERATURE:

77° F (ADJ.) COOLING SETPOINT

ALARMS SHALL BE PROVIDED AS FOLLOWS:

LOW ZONE TEMP: IF THE ZONE TEMPERATURE FALLS BELOW 55 DEGREES (ADJ.).

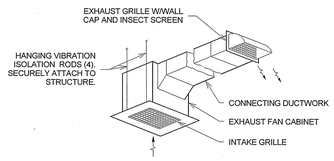
HIGH ZONE TEMP: IF THE ZONE TEMPERATURE RISES ABOVE 80 DEGREES (ADJ.).

(T) AI - ZONE TEMP

	HARDWARE POINTS				SOFTWARE POINTS						
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
ZONE TEMP	X								X		X
LOW ZONE TEMP										X	
HIGH ZONE TEMP										X	
TOTALS	1	0	0	0	0	0	0	0	1	2	1
TOTAL HARDWARE (1)					TOTAL SOFTWARE (3)						

REFER TO SPECIFICATION SECTION 23 09 23 FOR INTEGRATION REQUIREMENTS

1 MH401 BAS ZONE TEMPERATURE MONITORING
N.T.S.

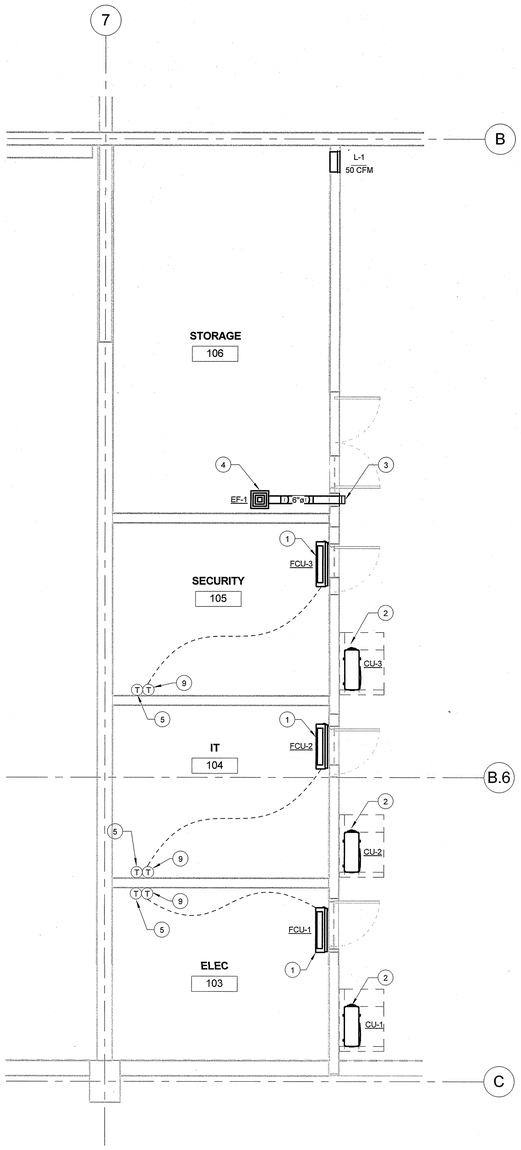


2 MH401 CEILING EXHAUST FAN DETAIL
N.T.S.

ELECTRIC UNIT HEATER SCHEDULE

TAG	LOCATION	AREA AND/OR BLDG SERVED	TYPE	MIN. CAPACITY	POWER			FAN MOTOR			REMARKS
					AMP	PHASE	VOLT	HP	PHASE	VOLT	
EUH-1	ELEVATOR SHAFT	ELEVATOR SHAFT	ELECTRIC	1708 Btu/h	4.2	1	120	NA	NA	NA	1, 2, 3, 4
EUH-2	ELEVATOR SHAFT	ELEVATOR SHAFT	ELECTRIC	1708 Btu/h	4.2	1	120	NA	NA	NA	1, 2, 3, 4
EUH-3	ELEVATOR CONTROL CLOSET	ELEVATOR CONTROL CLOSET	ELECTRIC	1708 Btu/h	4.2	1	120	NA	NA	NA	1, 2, 3, 4

REMARKS:
1. 500 W ELEMENT.
2. WITH INTEGRAL THERMOSTAT.
3. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATION.
4. CONVECTION SPECIALTY HEATER



5 MH401 PARTIAL MECHANICAL PLAN - LEVEL 1
1/4" = 1'-0"

KEY NOTE

1 INSTALL FAN COIL UNIT ABOVE DOOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS PROVIDING NECESSARY CLEARANCE. COORDINATE EXACT LOCATION WITH EQUIPMENT IN ROOM. ROUTE CONDENSATE DRAIN SO IT TERMINATES AT 6" AFF, OUTSIDE ROOM. PROVIDE RIGID PIPE FOR WALL PENETRATION AND ELBOW DOWN ONCE OUTSIDE. ROUTE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATION.

2 SECURELY MOUNT CONDENSING UNIT ON PLATFORM. PROVIDE NECESSARY CLEARANCE AND INSTALL PER MANUFACURER'S RECOMMENDATIONS.

3 PROVIDE 6" WALL CAP TERMINATION.

4 SEE 2/MH401 CEILING EXHAUST FAN DETAIL.

5 BAS ZONE SENSOR PROVIDED BY CONTROLS CONTRACTOR. SENSOR MONITORS ROOM TEMPERATURE AND TRIGGERS AN ALARM FOR EITHER HIGH OR LOW ROOM TEMPERATURE. IF THE ROOM TEMPERATURE FALLS BELOW 55 DEG F (ADJ) AN ALARM IS ACTIVATED. IF THE ROOM TEMPERATURE RISES ABOVE 80 DEG F (ADJ) AN ALARM IS ACTIVATED. THE BAS SYSTEM SHALL MAINTAIN TRENDS FOR THE ROOM TEMPERATURE IN MAXIMUM 10 MINUTE INCREMENTS FOR AT LEAST THE PAST 30 DAYS. REFER TO SPECIFICATION SECTION 23 09 23 FOR INTEGRATION REQUIREMENTS.

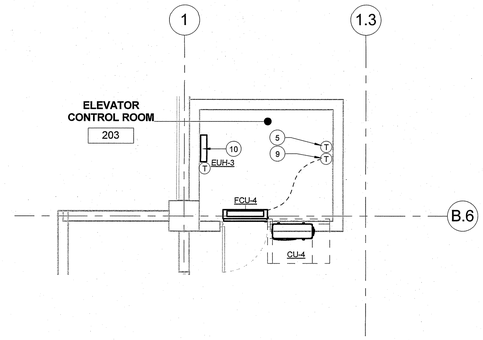
6 SIDEWALL EXHAUST FAN FOR ELEVATOR SHAFT VENTILATION TO BE INSTALLED AT APPROXIMATELY 13' ABOVE 4TH LEVEL FINISHED FLOOR ELEVATION PROVIDE WITH LINE VOLTAGE THERMOSAT SET AT 80°F. COORDINATE FINAL LOCATION WITH SELECTED ELEVATOR MACHINERY.

7 ELECTRIC UNIT HEATER TO BE INSTALLED AT APPROXIMATELY 13'-6" ABOVE 4TH LEVEL FINISHED FLOOR ELEVATION. COORDINATE FINAL LOCATION WITH SELECTED ELEVATOR MACHINERY.

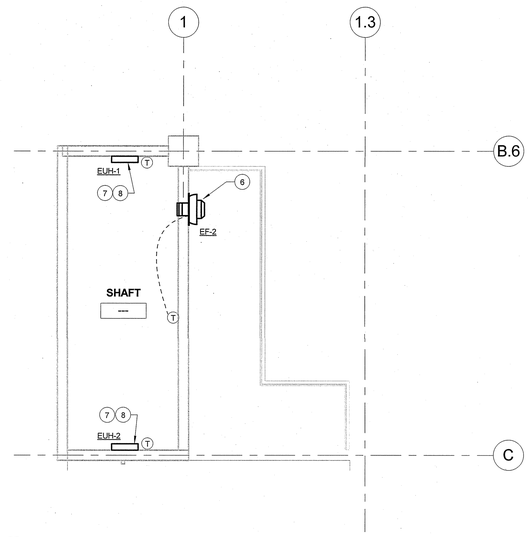
8 ELECTRIC UNIT HEATER SET AT 40°F FOR FREEZE PROTECTION.

9 MANUFACTURER PROVIDED THERMOSTAT. THIS THERMOSTAT PROVIDES ALL INFORMATION, CONTROL, AND/OR INPUTS TO CONTROL THE MINI-SPLIT SYSTEM.

10 ELECTRIC UNIT HEATER SET AT 40°F FOR FREEZE PROTECTION. INSTALL AT APPROXIMATELY 24" ABOVE 2ND LEVEL FINISHED FLOOR ELEVATION.



7 MH401 PARTIAL MECHANICAL PLAN - ELEVATOR CONTROL CLOSET
1/4" = 1'-0"



6 MH401 PARTIAL MECHANICAL PLAN - TOP OF ELEVATOR SHAFT
1/4" = 1'-0"

Revisions:	Date

U.S. Department of Veterans Affairs
Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

ARCHITECT/ENGINEERS:

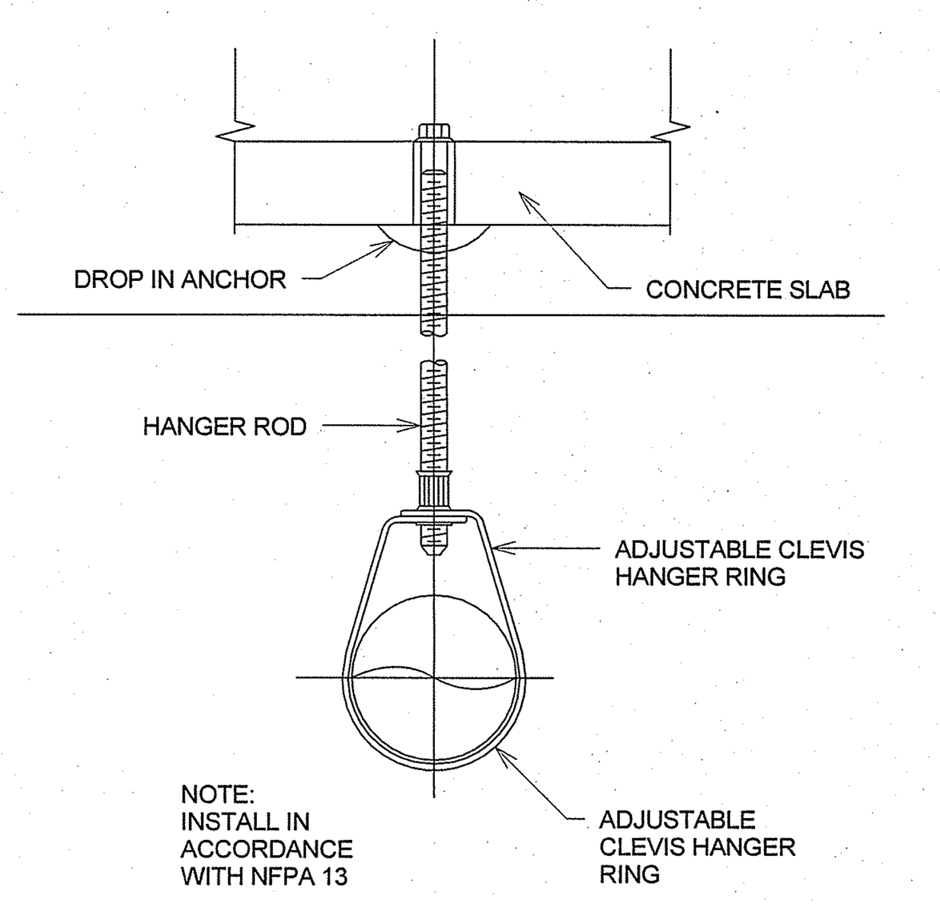
PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer	Elec Engineer	Civil Engineer	Functional Design
APOGEE CONSULTING GROUP, PA	CMTA CONSULTING ENGINEERS	H2B Inc.,	CARL WALKER INC.
1151 Kildare Farm Road, Suite 120, Cary, NC 27511	1610 Woodstead Court, Suite 105 Woodlands, TX 77380	1225 North Loop West,Suite 900 Houston, TX 77008	2801 Network Blvd., Suite 101 Frisco, TX 75034
T: 919.858.7420	T: 281.419.9899	T: 713.864.2900	T: 469.777.5143

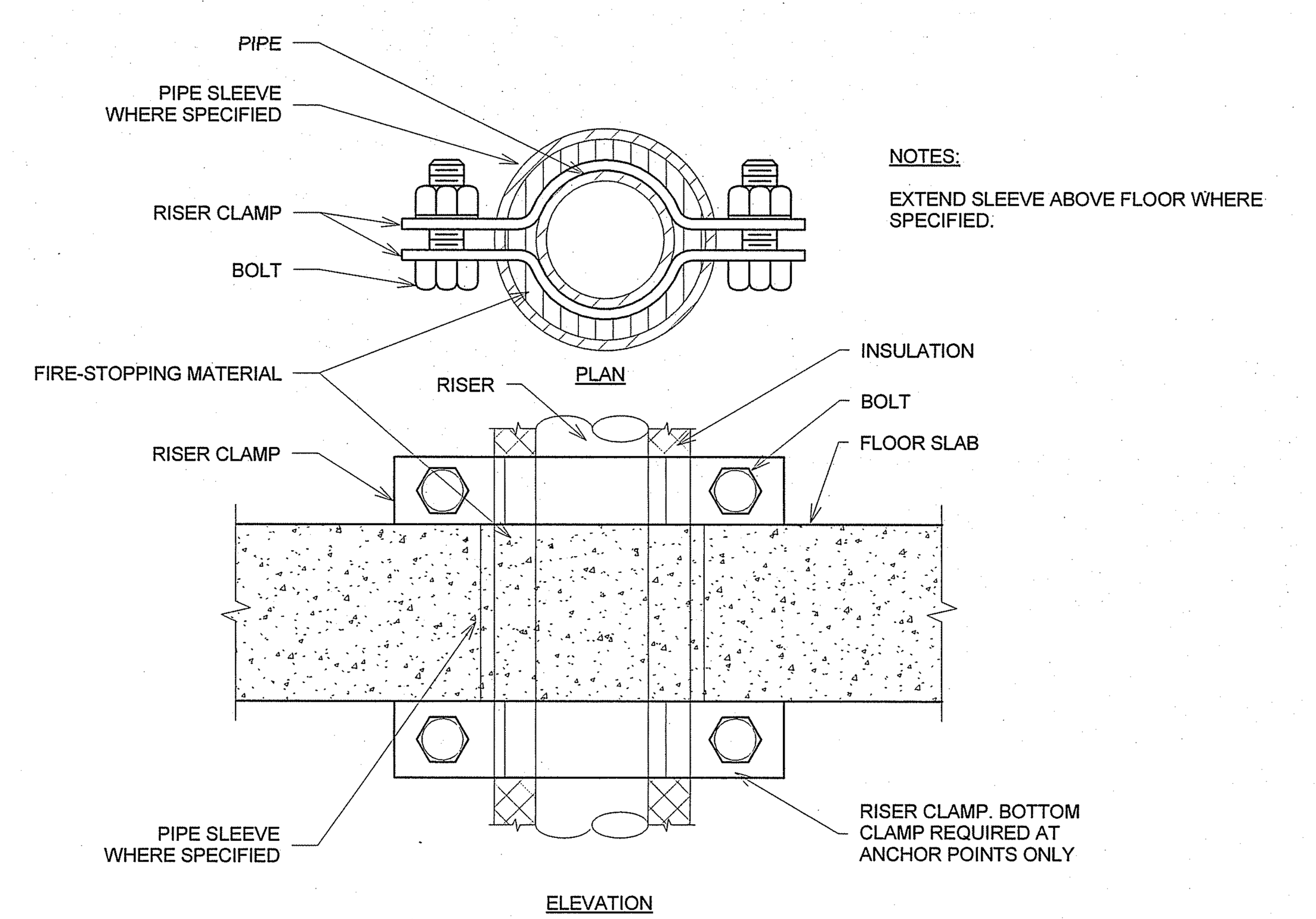
100% CONSTRUCTION DOCUMENTS

Drawing Title: ENLARGED MECHANICAL PLANS AND SCHEDULES	Project Title: BUILD PARKING GARAGE A	Apogee Project #: 14-188	OFFICE OF FACILITIES MANAGEMENT
		Building Number: 123	
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER	Location: Michael E. DeBakey VAMC, Houston, TX	Drawing Number: MH401	VA Project Number: 580-321
	Date: 2015/10/16 / Checked By: DJR / Drawn By: ORD		U.S. Department of Veterans Affairs

C:\Users\orozdiaz\Documents\14-188-Mech-Plumb_orozdiaz.rvt



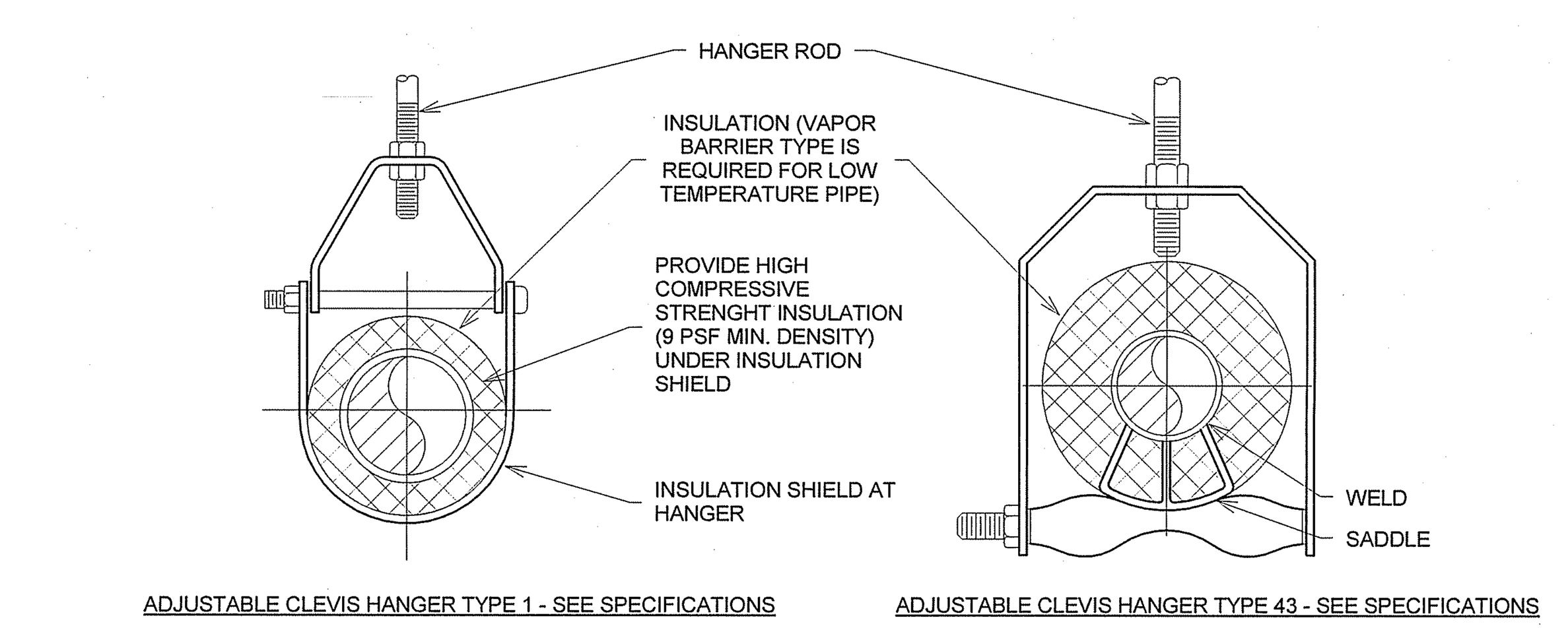
3 CONCRETE PIPE HANGER DETAIL
PI100 N.T.S.

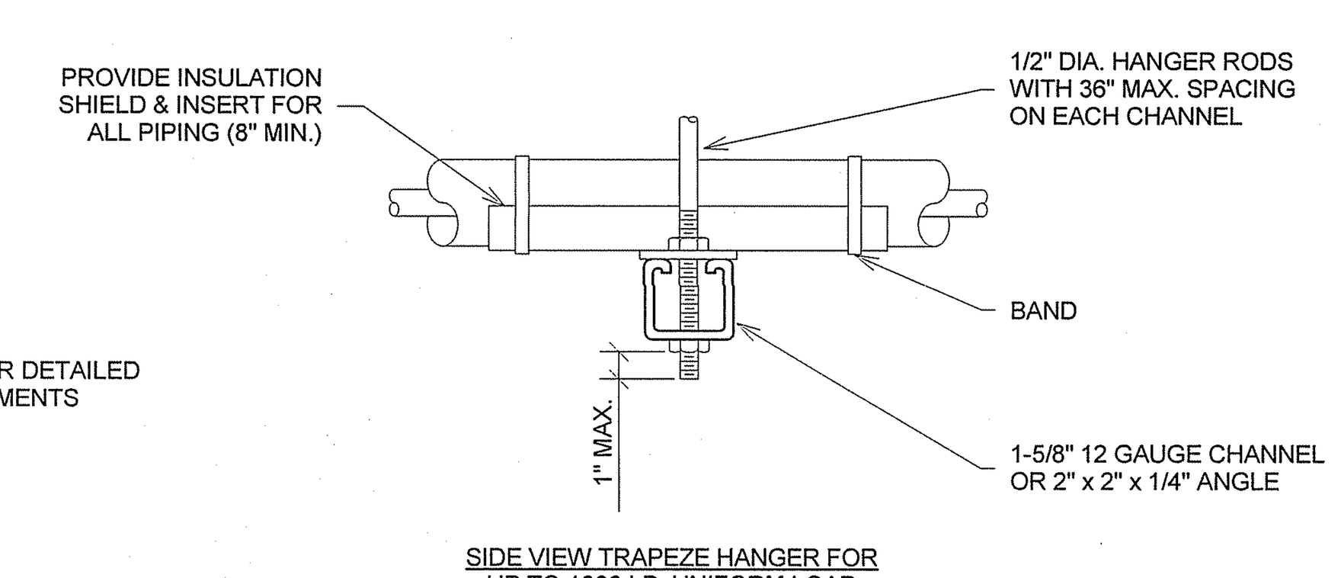


NOTES:

EXTEND SLEEVE ABOVE FLOOR WHERE SPECIFIED.

2 SUPPORT/ANCHOR FOR PIPE RISERS
PI100 N.T.S.

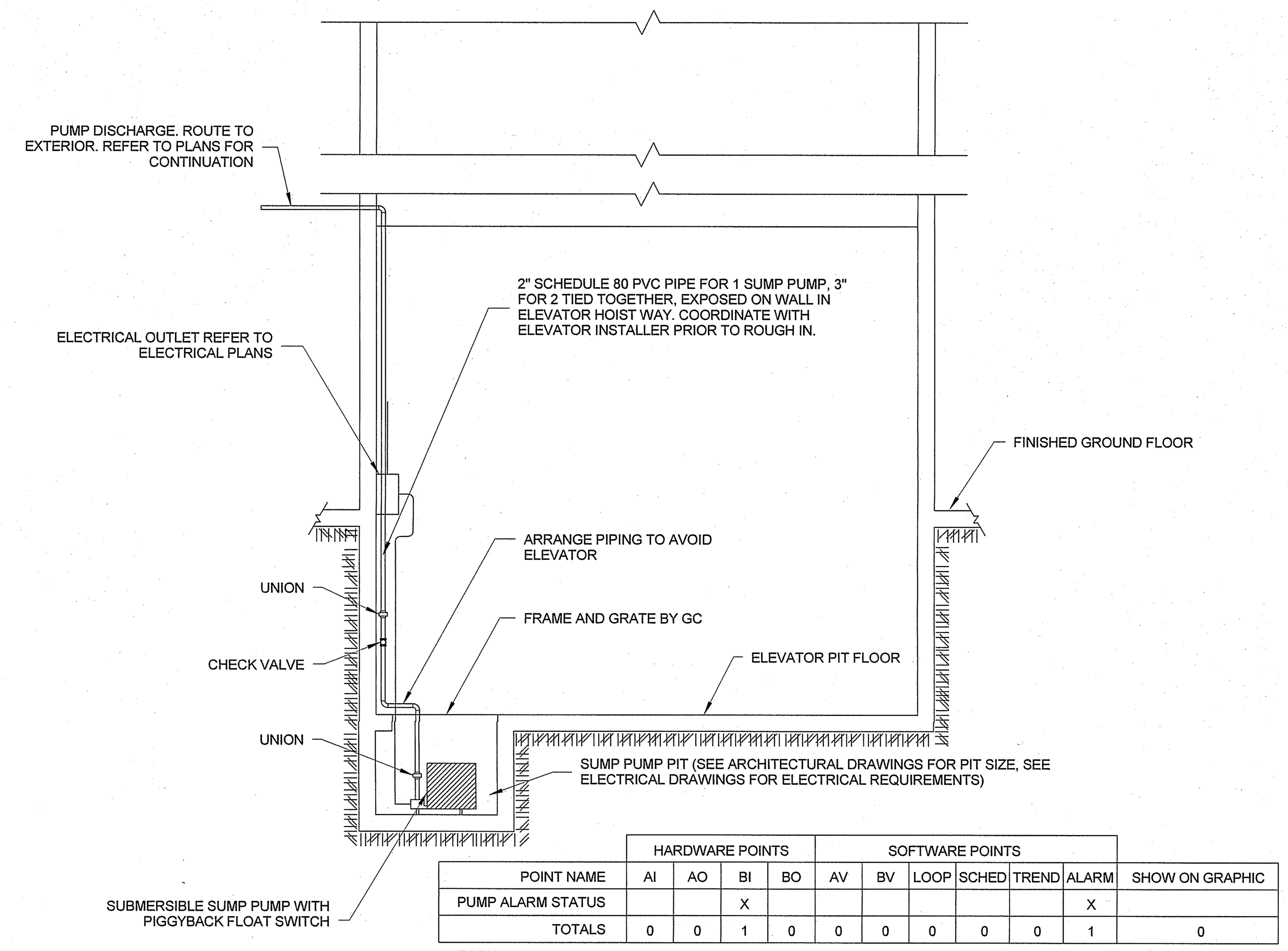




NOTES:
SEE SPECIFIER FOR DETAILED HANGER REQUIREMENTS

MAXIMUM PIPE/TUBING SUPPORT SPACING											
NOM. SIZE (IN.)	THRU 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
PIPE (FT.)	7	7	7	9	10	11	12	14	16	17	19
TUBING (FT.)	5 FT	6	7	8	8	9	10	12	13	14	16
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE											

1 PIPE HANGERS
PI100 N.T.S.



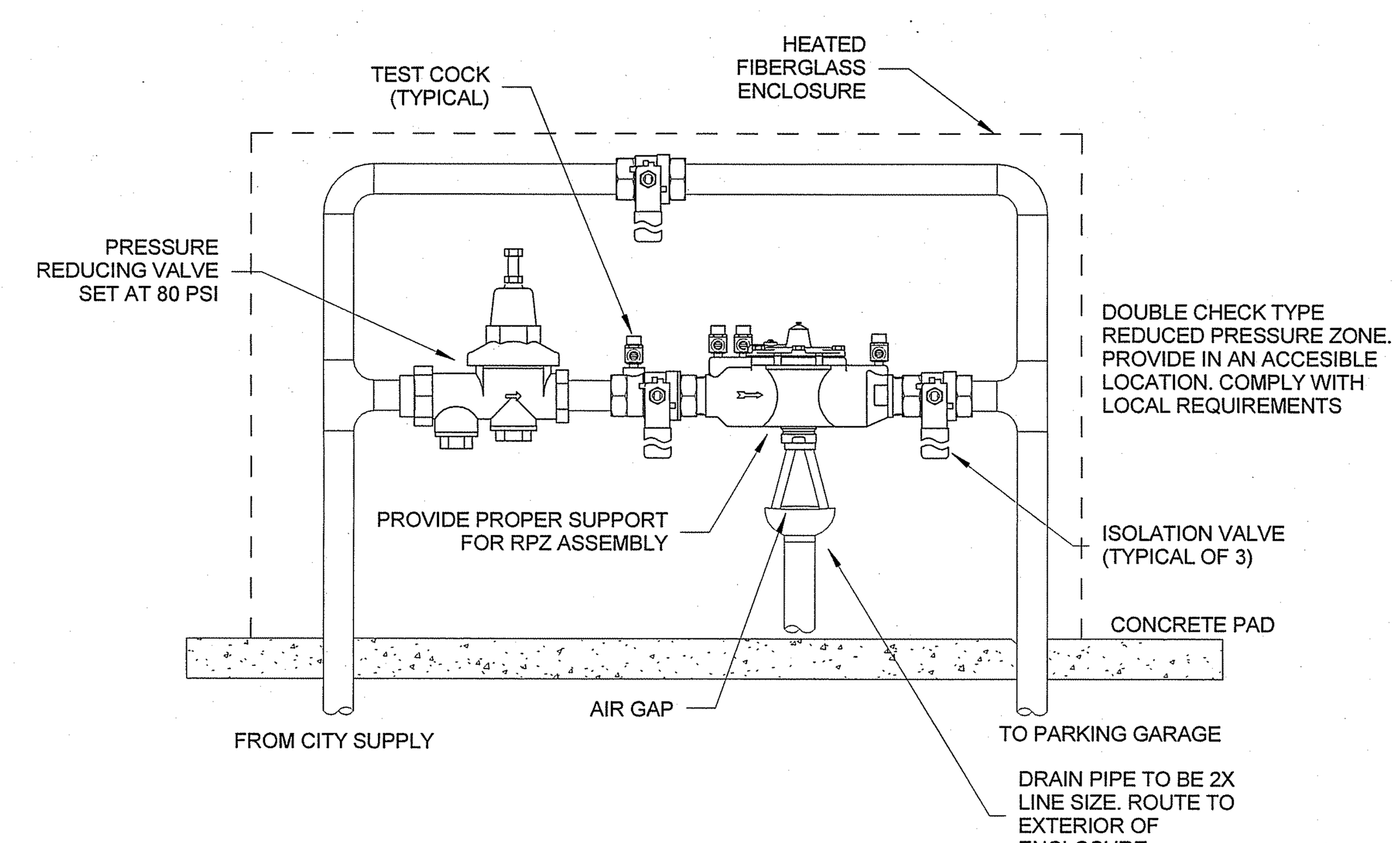
	HARDWARE POINTS				SOFTWARE POINTS						
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
PUMP ALARM STATUS			X							X	
TOTALS	0	0	1	0	0	0	0	0	0	1	0

TOTAL HARDWARE (1) TOTAL SOFTWARE (1)

SUMP PUMP CONTROL SEQUENCE:

ON WATER RISE, THE PUMP WILL ACTIVATE WHEN THE WATER LEVEL REACHES THE "START" PROBE. PUMP WILL REMAIN ON UNTIL THE WATER LEVEL IS BELOW THE "OFF" PROBE. WHEN THE "OFF" PROBE NO LONGER SENSES WATER IT TURNS THE PUMP OFF.

4 SUMP PUMP DETAIL
PI100 N.T.S.



5 RPZ INSTALLATION DETAIL
PI100 N.T.S.

PLUMBING GENERAL NOTES

IN THE CASE OF CONFLICTS AND DISCREPANCIES WITHIN OR AMONG THE CONTRACT DRAWINGS, THE BETTER QUALITY, MORE STRINGENT REQUIREMENTS OR GREATER QUALITY OF WORK, AS DETERMINED BY THE GOVERNMENT, SHALL BE PROVIDED.

1. THE ENTIRE PLUMBING SYSTEM SHALL BE IN ACCORDANCE WITH ALL PROJECT SPECIFICATIONS AND ALL VA STANDARDS, EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S WRITTEN RECOMMENDATIONS.
2. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE ROUTING OF ALL PIPING WITH EXISTING CONDITIONS AND SHALL PROVIDE ANY NECESSARY OFFSETS, REROUTING, ETC. REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.
3. THESE PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS, TEES, ELBOWS, ETC FOR A COMPLETE WORKING PLUMBING SYSTEM.
4. THE PLUMBING CONTRACTOR SHALL COMPLY WITH ALL VA PERMIT AND INSPECTION PROCEDURES REQUIRED FOR THIS WORK.
5. CONTRACTOR SHALL COORDINATE ANY PLUMBING SYSTEM REQUIRING SHUTDOWN WITH THE OWNER IN ADVANCE. SEE SPECIFICATION SECTION 01 00 00 FOR SPECIFIC TIME FRAME REQUIREMENTS.
6. ALL DOMESTIC PIPING SHOWN IS LOCATED OVERHEAD OR MOUNTED ON THE WALLS UNLESS NOTED OTHERWISE.
7. ALL PIPING SYSTEMS SHALL BE SUPPORTED AS REQUIRED BY ALL VA STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.
8. ALL PIPING PENETRATIONS THRU NEW OR EXISTING WALLS OR FLOORS SHALL BE SEALED TO EQUAL THE RATING OF THE NEW OR EXISTING WALL OR FLOOR.
9. ALL PLUMBING SYSTEMS SHALL BE TESTED AS REQUIRED PER VA STANDARDS.
10. THE PLUMBING CONTRACTOR SHALL COORDINATE ALL PLUMBING PIPING WITH ALL STRUCTURAL COMPONENTS.
11. THE ENTIRE DOMESTIC WATER SYSTEM SHALL BE DISINFECTED IN ACCORDANCE WITH ALL VA STANDARDS.
12. MANUFACTURER'S TRADE NAMES AND NUMBERS USED HEREIN ARE ONLY TO IDENTIFY COLORS, FINISHES, TEXTURES, AND PATTERNS AS THE BASIS OF DESIGN. PRODUCTS OF AUTHORIZED EQUAL MANUFACTURER'S EQUIVALENT TO COLORS, FINISHES, TEXTURES AND PATTERNS OF MANUFACTURERS LISTED THAT MEET REQUIREMENTS OF TECHNICAL SPECIFICATIONS IN EVERY RESPECT MAY BE ACCEPTABLE WITH SUBMITTAL OF A COMPLETED SUBSTITUTION REQUEST CONTAINING ALL PRODUCT DATA, TESTING AND ACTUAL SAMPLES AND UPON APPROVAL IN WRITTING BY CONTRACTING OFFICER.

PLUMBING LEGEND

——SD——	STORM DRAIN (SD)
— — SD — —	STORM DRAIN (SD) - UNDER SLAB
— · — · —	DOMESTIC COLD WATER PIPING (DCW)
——O	PIPE TURNS UP
——Ͽ	PIPE TURNS DOWN
——S	CONTINUATION

PLUMBING ABREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT
FFE	FINISHED FLOOR ELEVATION
AFF	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
DCW	DOMESTIC COLD WATER
FCO	FLOOR CLEANOUT (FLOOR OR SLAB)
FD	FLOOR DRAIN
GCO	GRADE CLEANOUT
GW	GREASE WASTE
HB	HOSE BIBB
HD	HUB DRAIN
IW	INDIRECT WASTE
DHW	DOMESTIC HOT WATER
P-#	PLUMBING FIXTURE - NUMBER
P.C.	PLUMBING CONTRACTOR
V	VENT
V.T.R.	VENT THROUGH ROOF
W	WASTE
WCO	WALL CLEANOUT
SW	STORM WATER

SUMP PUMP SCHEDULE

MARK	LOCATION	AREA SERVED	TYPE	FLUID	FLOW	HEAD	TEMP.	MIN % EFF	HP	PHASE	VOLT	SPEED CONTROL	REMARKS
SP-1	ELEVATOR PIT	ELEVATOR SHAFT	SIMPLEX	WATER	50 GPM	20 ftH2O	40 °F	NA	1/2	1	115	NO	WITH HIGH WATER LIMIT ALARM. INTEGRATE ALARM WITH BUILDING AUTOMATION SYSTEM

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTON	WASTE PIPE	VENT PIPE	COLD WATER	HOT WATER	WASTE FIXTURE UNITS	WATER FIXTURE UNITS	WRIST BLADE HANDLES	ELECTRIC SENSOR	REMARKS
CO	FLOOR CLEANOUT	--	--	--	--	--	--	--	--	SEE SPECIFICATION SECTION 22 13 00.
FCO	FLOOR CLEANOUT	--	--	--	--	--	--	--	--	SEE SPECIFICATION SECTION 22 13 00. GREY IRON HOUSING WITH CLAMPING DEVICE
GD-1	PARKING DECK DRAIN FOR SLABS	8"	--	--	--	--	--	--	--	SEE SPECIFICATION SECTION 22 14 00
GD-2	PARKING DECK DRAIN FOR SLABS	4"	--	--	--	--	--	--	--	SEE SPECIFICATION SECTION 22 14 00
P-801	FREEZELESS WALL HYDRANT	--	--	3/4"	--	--	0	--	--	SEE SPECIFICATION SECTION 22 40 00. AUTOMATIC DRAINING BACKFLOW PROTECTION, LOOSE KEY
PRV-1	PRESSURE REDUCING VALVE WITH INTEGRAL STRAINER	--	--	1"	--	--	--	--	--	SINGLE UNION FNPT INLET AND FNPT OUTLET
RD-2	DOME TYPE ROOF DRAIN	3"	--	--	--	--	--	--	--	ROOF DRAIN
RPZ-1	REDUCED PRESSURE PRINCIPLE ASSEMBLY	--	--	1"	--	--	--	--	--	PROVIDE AIR GAP FITTING AND INDIRECT WASTE TO NEAR FLOOR DRAIN

DEDUCT ALTERNATES (#)

1. DEDUCT 1
   a. REMOVE ELEVATOR #2 CAB AND EQUIPMENT. ELEVATOR HOIST WAY TO REMAIN.
   b. REMOVE CAR/PARKING COUNT SYSTEM
   c. REMOVE STOREFRONT FROM STAIR SHAFTS
2. DEDUCT 2 - AREA DEDUCT #1
   a. DEDUCT LEVEL 4 PRECAST CONCRETE STRUCTURE AND ASSOCIATE ITEMS TO COLUMN LINE 7.
   b. REDUCE STAIR AND ELEVATOR TOWER 1 LEVEL
3. DEDUCT 3 - AREA DEDUCT #2
   a. DEDUCT LEVEL 4 PRECAST CONCRETE STRUCTURE AND ASSOCIATE ITEMS FROM COLUMN LINE 7 TO LEVEL 3 RAMP COLUMN LINE 3.
   b. REDUCE NORTH STAIR TOWER 1 LEVEL.
   c. REMOVE SILANE SEALER ON ALL LEVELS.

C:\Users\oruizdiaz\Documents\14-188-Mech-Plumb_oruizdiaz.rvt

Revisions: | Date

U.S. Department of Veterans Affairs
Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

SEAL 037960 NORTH CAROLINA PROFESSIONAL ENGINEER DORELL J. ROYSTER 10/16/15

ARCHITECT/ENGINEERS:

PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer
APOGEE CONSULTING GROUP, PA
1151 Kildare Farm Road, Suite 120, Cary, NC 27511
T: 919.858.7420

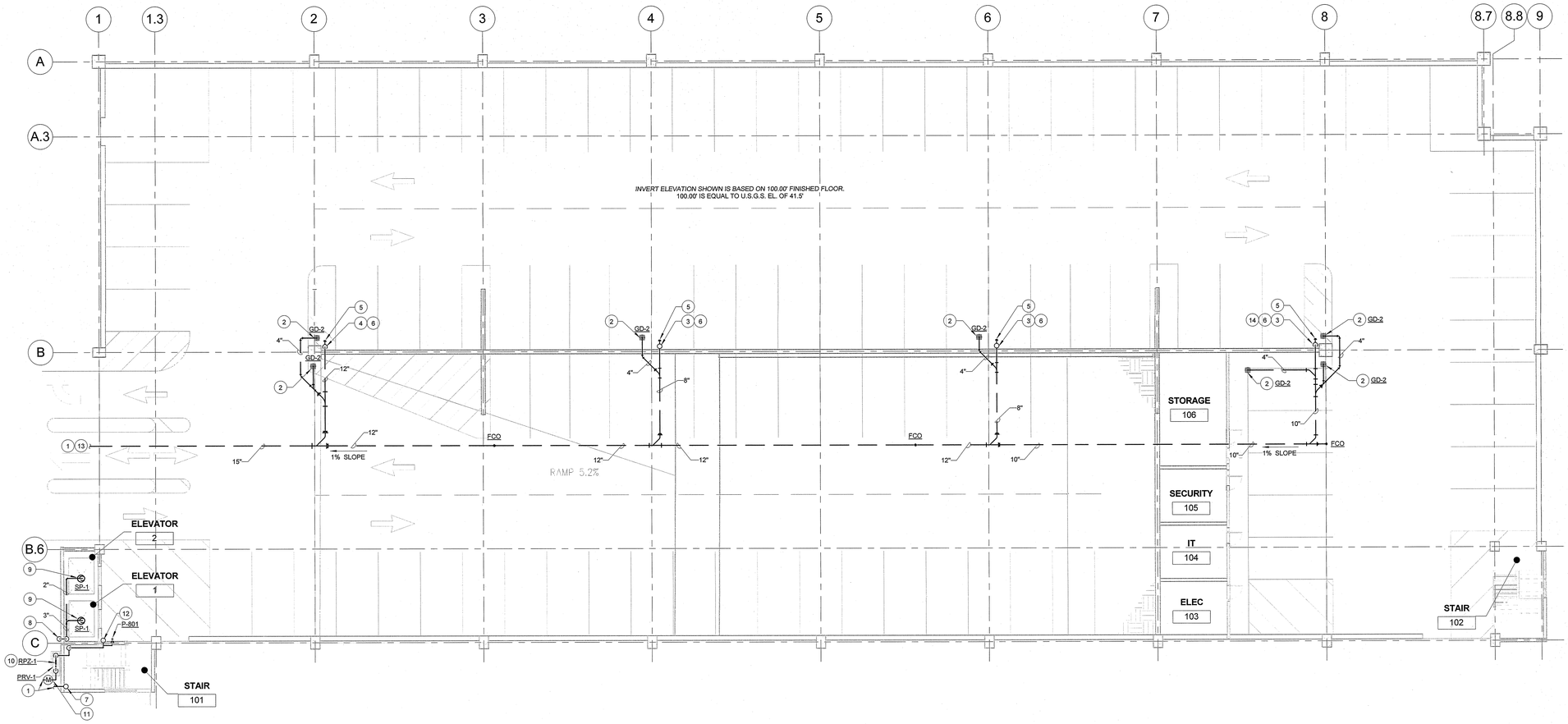
Elec Engineer
CMTA CONSULTING ENGINEERS
1610 Woodstead Court, Suite 105 Woodlands, TX 77380
T: 281.419.9899

Civil Engineer
H2B Inc..
1225 North Loop West,Suite 900 Houston, TX 77008
T: 713.864.2900

Functional Design
CARL WALKER INC.
2801 Network Blvd., Suite 101 Frisco, TX 75034
T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

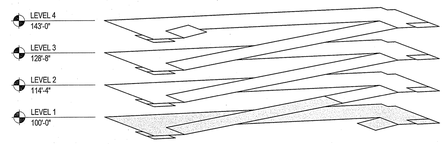
Drawing Title: PLUMBING NOTES, ABBREVIATIONS, AND LEGEND
Project Title: BUILD PARKING GARAGE A
Apogee Project #: 14-188
Building Number: 123
OFFICE OF FACILITIES MANAGEMENT
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER
Location: Michael E. DeBakey VAMC, Houston, TX
Date: 2015/10/16
Checked By: DJR
Drawn By: ORD
Drawing Number: PI100
VA Project Number: 580-321
VA U.S. Department of Veterans Affairs



KEY NOTE

1. SEE CU101 SITE UTILITY PLAN FOR CONTINUATION.
2. CENTER DRAINS ON EDGE OF WASH. COORDINATE FLOOR DRAIN LOCATIONS WITH STRUCTURAL PLANS.
3. 8" Ø STORM DRAIN CONDUCTOR UP. TRANSITION TO 10" Ø WHEN TURNING HORIZONTAL UNDER SLAB.
4. 10" Ø STORM DRAIN CONDUCTOR UP.
5. PROVIDE CLEANOUT AT THE BASE OF THE RISER.
6. SEE 1/PP102 FOR CONTINUATION.
7. 3" Ø STORM DRAIN CONDUCTOR UP TO STAIR TOWER ROOF. SEE 1/PP102 FOR CONTINUATION.
8. 3" SUMP PUMP DISCHARGE. ELBOW PIPE DOWN 90° OUTSIDE THE BUILDING. DISCHARGE PIPE TO TERMINATE AT 24" ABOVE FINISHED GRADE. PROVIDE SPLASH BLOCK.
9. SEE 4/PI100 SUMP PUMP DETAIL.
10. RPZ IN HOT BOX (30W). SEE 5/PI100.
11. WATER METER WITH PULSE OUTPUT, SEE SPECIFICATION 220519. PROVIDE BAS CONNECTION, SEE SPECIFICATION 251010.COORDINATE BAS CONNECTION WITH CONTROLS CONTRACTOR.
12. 1" DOMESTIC COLD WATER UP AND DOWN. SEE 1/PP102 FOR CONTINUATION. HEAT TRACE EXPOSED DOMESTIC WATER PIPE.
13. INVERT ELEVATION FOR STORM PIPE IS 5 FEET BELOW FINISHED FLOOR ELEVATION. COORDINATE WITH CIVIL PRIOR TO INSTALLATION OF STORM PIPING.
14. INVERT ELEVATION STARTING POINT IS 2 FEET BELOW FINISHED FLOOR.

1 / PP101 LEVEL 1 - PLUMBING PLAN
3/32" = 1'-0"



ISOMETRIC KEYPLAN

Revisions:	Date

VA | U.S. Department of Veterans Affairs
Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

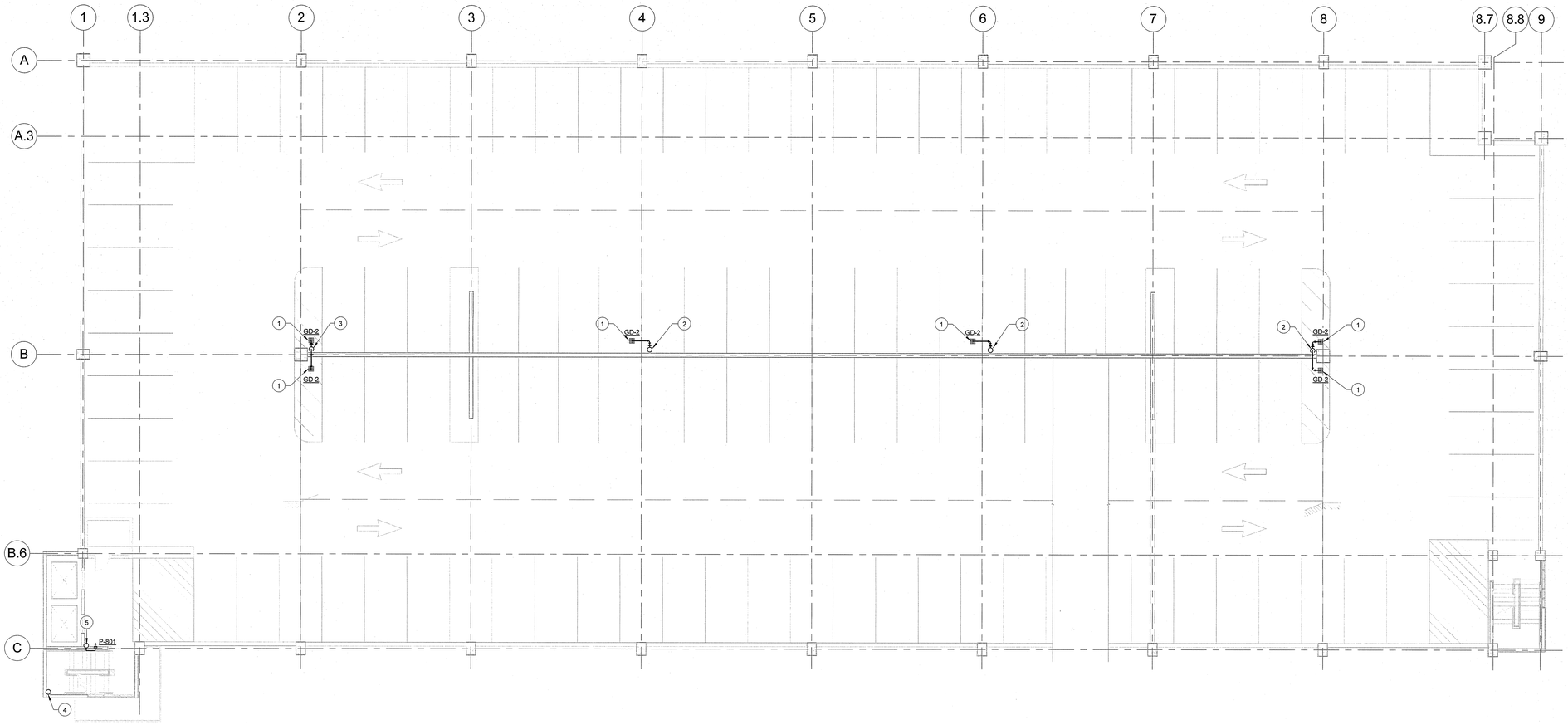
ARCHITECT/ENGINEERS:

PROJECT LEAD Architect, Structural Engineer	Mech & Plumb Engineer	Elec Engineer	Civil Engineer	Functional Design
GUIDON DESIGN	APOGEE CONSULTING GROUP, PA	CMTA CONSULTING ENGINEERS	H2B Inc..	CARL WALKER INC.
905 N. CAPITOL AVE. SUITE 100 INDIANAPOLIS, IN. 46204 317.800.6388	1151 Kildare Farm Road, Suite 120, Cary, NC 27511 T: 919.858.7420	1610 Woodstead Court, Suite 105 Woodlands, TX 77380 T: 281.419.9899	1225 North Loop West,Suite 900 Houston, TX 77008 T: 713.864.2900	2801 Network Blvd., Suite 101 Frisco, TX 75034 T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

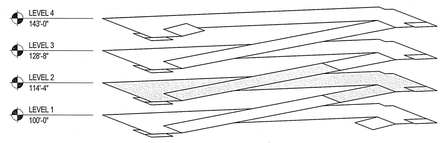
Drawing Title: LEVEL 1 PLUMBING PLAN	Project Title: BUILD PARKING GARAGE A	Apogee Project #: 14-188	OFFICE OF FACILITIES MANAGEMENT
		Building Number: 123	
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER	Location: Michael E. DeBakey VAMC, Houston, TX	Drawing Number: PP101	VA Project Number: 580-321
	Date: 2015/10/16 · Checked By: DJR · Drawn By: ORD		VA | U.S. Department of Veterans Affairs

C:\Users\orudisa\Documents\14-188-Mech-Plumb_orudisa.rvt



KEY	NOTE
1	CENTER DRAINS ON EDGE OF WASH. COORDINATE FLOOR DRAIN LOCATIONS WITH STRUCTURAL PLANS.
2	8" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP103 AND 1/PP101 FOR CONTINUATION.
3	10" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP103 AND 1/PP101 FOR CONTINUATION.
4	3" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP103 AND 1/PP101 FOR CONTINUATION.
5	1" DOMESTIC COLD WATER UP AND DOWN. SEE 1/PP103 AND 1/PP101 FOR CONTINUATION. HEAT TRACE EXPOSED DOMESTIC WATER PIPE.

1 / PP102 LEVEL 2 - PLUMBING PLAN
3/32" = 1'-0"



ISOMETRIC KEYPLAN

Revisions: | Date

VA | U.S. Department of Veterans Affairs

Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

ARCHITECT/ENGINEERS:

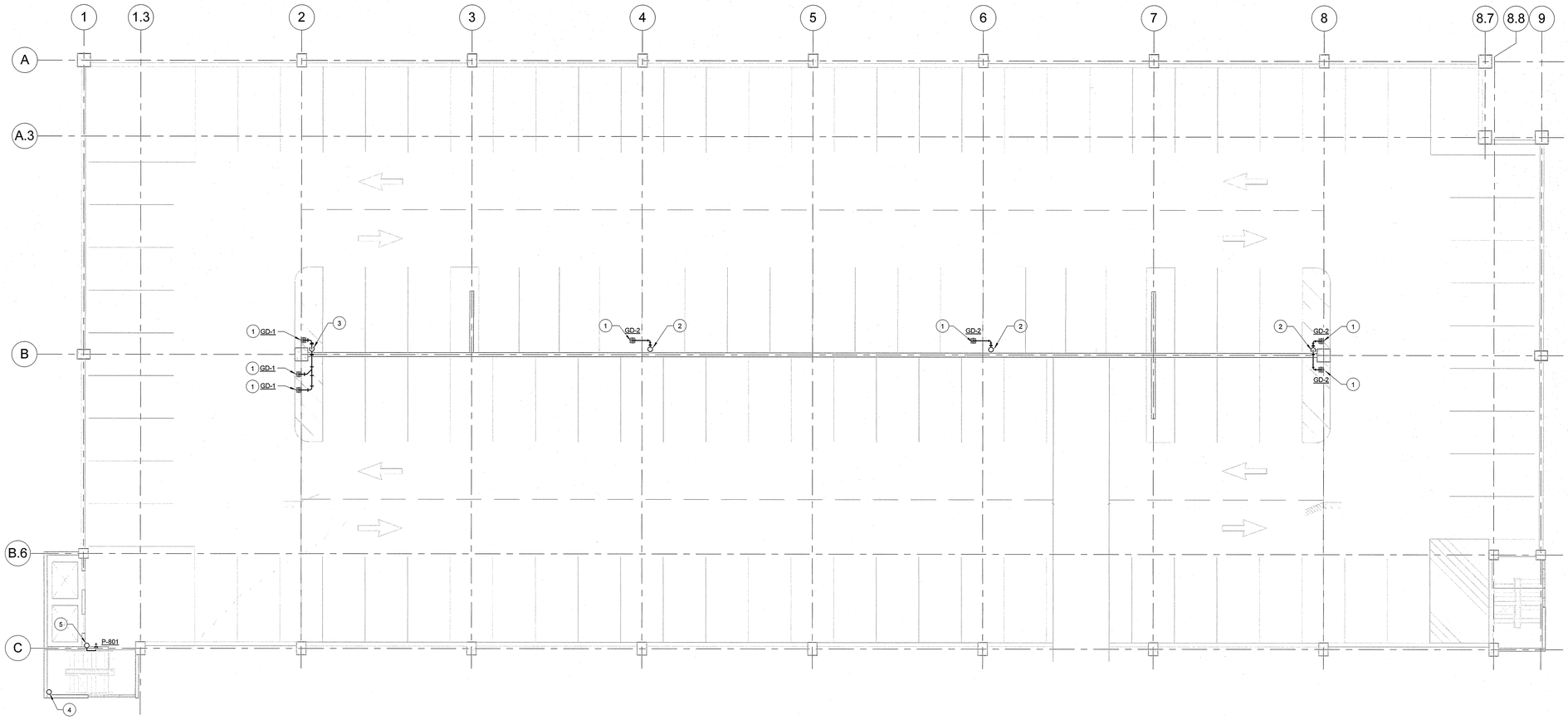
PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer	Elec Engineer	Civil Engineer	Functional Design
APOGEE CONSULTING GROUP, PA	CMTA CONSULTING ENGINEERS	H2B Inc.,	CARL WALKER INC.
1151 Kildare Farm Road, Suite 120, Cary, NC 27511	1610 Woodstead Court, Suite 105 Woodlands, TX 77380	1225 North Loop West,Suite 900 Houston, TX 77008	2801 Network Blvd., Suite 101 Frisco, TX 75034
T: 919.858.7420	T: 281.419.9899	T: 713.864.2900	T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

Drawing Title: LEVEL 2 - PLUMBING PLAN	Project Title: BUILD PARKING GARAGE A	Apogee Project #: 14-188	OFFICE OF FACILITIES MANAGEMENT
		Building Number: 123	
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER	Location: Michael E. DeBakey VAMC, Houston, TX	Drawing Number: PP102	VA Project Number: 580-321
	Date: 2015/10/16 · Checked By: DJR · Drawn By: ORD		VA | U.S. Department of Veterans Affairs

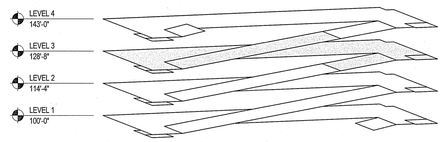
C:\Users\orudzitz\Documents\14-188-Mech-Plumb_orudzitz.rvt



KEY	NOTE
1	CENTER DRAINS ON EDGE OF WASH. COORDINATE FLOOR DRAIN LOCATIONS WITH STRUCTURAL PLANS.
2	8" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP104 AND 1/PP102 FOR CONTINUATION.
3	10" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP104 AND 1/PP102 FOR CONTINUATION.
4	3" Ø STORM DRAIN CONDUCTOR UP AND DOWN. SEE 1/PP104 AND 1/PP102 FOR CONTINUATION.
5	1" DOMESTIC COLD WATER DOWN AND 3/4" COLD WATER UP. SEE 1/PP104 AND 1/PP102 FOR CONTINUATION. HEAT TRACE EXPOSED DOMESTIC WATER PIPE.

1 / PP103 LEVEL 3 - PLUMBING PLAN

3/32" = 1'-0"



ISOMETRIC KEYPLAN

three inches = one foot 6"
one and one half inches = one foot 0 1 6"
one inch = one foot 0 2 6"
three quarters inch = one foot 0 2 6"
one half inch = one foot 0 4
three eighths inch = one foot 0 4
one quarter inch = one foot 0 8 4
one eighth inch = one foot 0 8 16

C:\Users\cruzdiaz\Documents\14-188-Mech-Plumb_cruzdiaz.rvt

Revisions:	Date

VA | U.S. Department of Veterans Affairs

Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

NORTH CAROLINA PROFESSIONAL SEAL 037960 ENGINEER DORELL J. ROSSER 10/14/15

ARCHITECT/ENGINEERS:

PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer
APOGEE CONSULTING GROUP, PA
1151 Kildare Farm Road, Suite 120,
Cary, NC 27511
T: 919.858.7420

Elec Engineer
CMTA CONSULTING ENGINEERS
1610 Woodstead Court, Suite 105
Woodlands, TX 77380
T: 281.419.9899

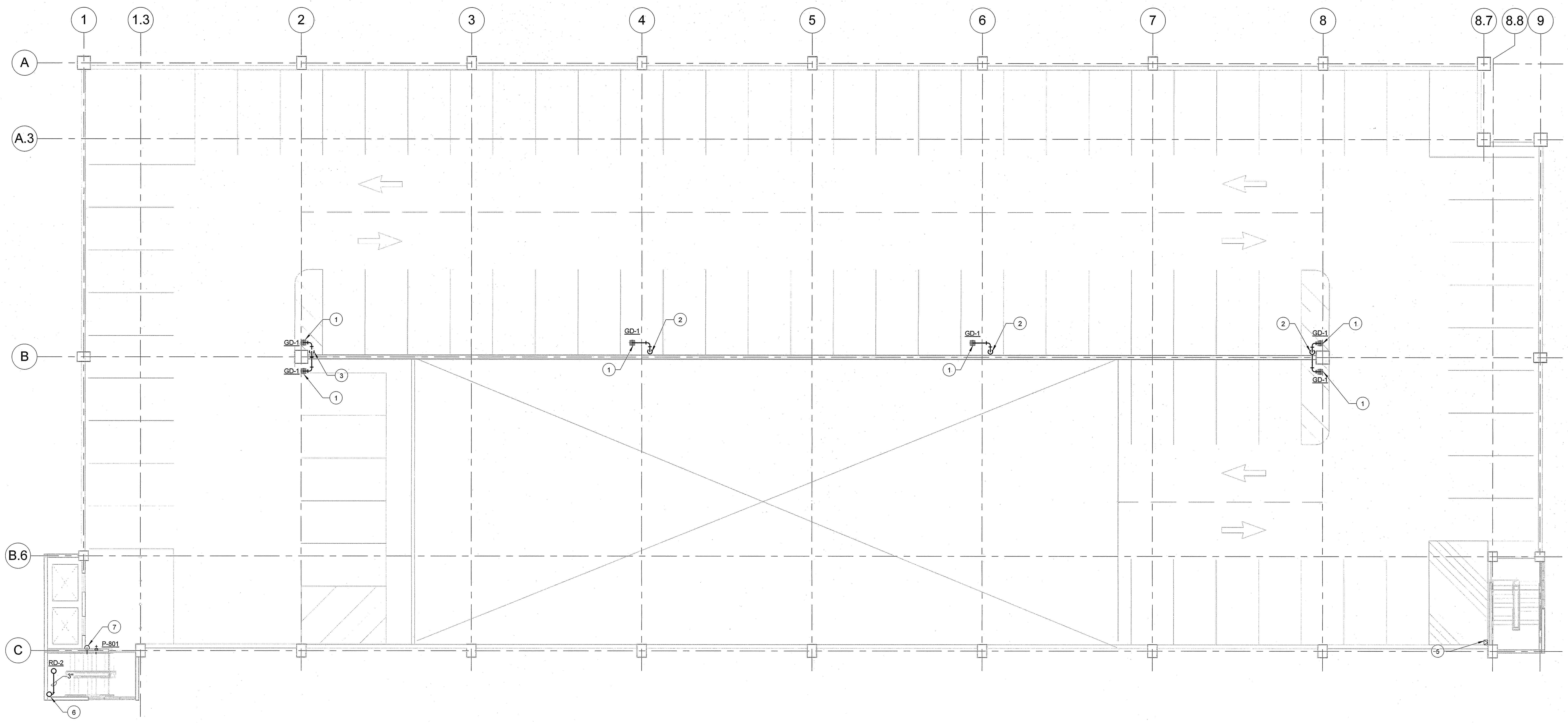
Civil Engineer
H2B Inc.,
1225 North Loop West,Suite 900
Houston, TX 77008
T: 713.864.2900

Functional Design
CARL WALKER INC.
2801 Network Blvd., Suite 101
Frisco, TX 75034
T: 469.777.5143

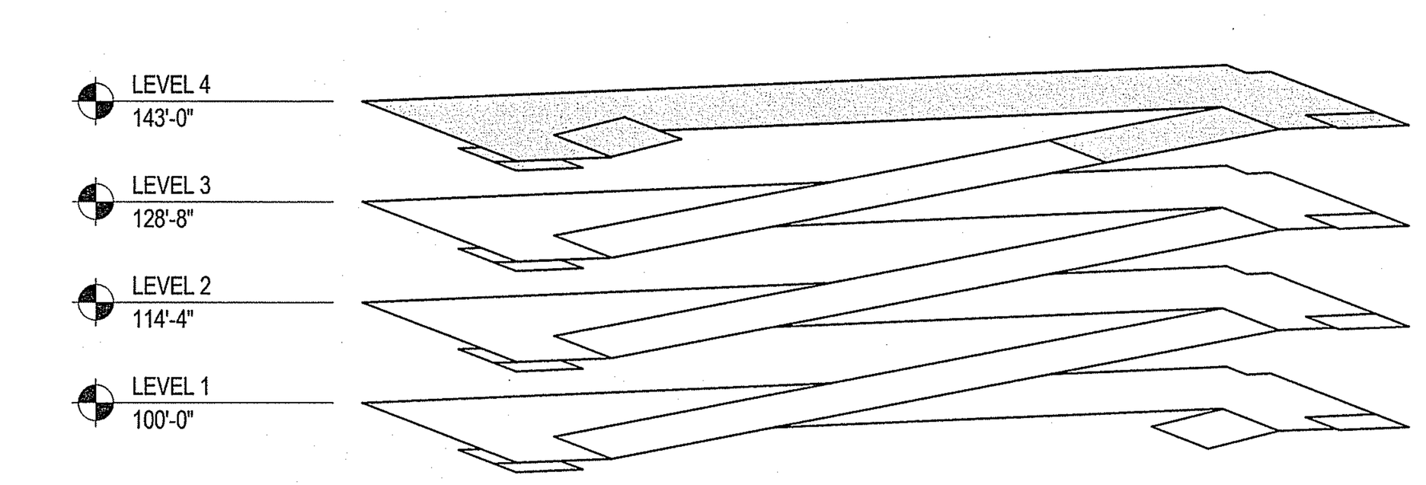
100% CONSTRUCTION DOCUMENTS

Drawing Title: LEVEL 3 - PLUMBING PLAN	Project Title: BUILD PARKING GARAGE A	Apogee Project #: 14-188	OFFICE OF FACILITIES MANAGEMENT
		Building Number: 123	
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER	Location: Michael E. DeBakey VAMC, Houston, TX	Drawing Number: PP103	VA Project Number: 580-321
	Date: 2015/10/16 / Checked By: DJR / Drawn By: ORD		VA | U.S. Department of Veterans Affairs

KEY	NOTE
1	CENTER DRAINS ON EDGE OF WASH. COORDINATE FLOOR DRAIN LOCATIONS WITH STRUCTURAL PLANS.
2	8" Ø STORM DRAIN CONDUCTOR DOWN. SEE 1/PP103 FOR CONTINUATION.
3	10" Ø STORM DRAIN CONDUCTOR DOWN. SEE 1/PP103 FOR CONTINUATION.
4	ROOF SCUPPER SERVING ELEVATOR TOWER ROOF TO DISCHARGE ON STAIRWELL ROOF.
5	ROOF SCUPPER TO DISCHARGE ON GARAGE DECK. PROVIDE A SPLASH BLOCK AND A 90° ELBOW TO DIRECT WATER AWAY FROM STAIR.
6	3" Ø STORM DRAIN CONDUCTOR DOWN. SEE 1/PP103 FOR CONTINUATION.
7	3/4" DOMESTIC COLD WATER DOWN. SEE 1/PP103 FOR CONTINUATION. HEAT TRACE EXPOSED DOMESTIC WATER PIPE.



1 PP104 LEVEL 4 - PLUMBING PLAN
3/32" = 1'-0"



ISOMETRIC KEYPLAN

Revisions:	Date

U.S. Department of Veterans Affairs
Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

NORTH CAROLINA PROFESSIONAL SEAL 037960 ENGINEER DORELL J. ROYSTER 10/16/15

ARCHITECT/ENGINEERS:

PROJECT LEAD
Architect, Structural Engineer
GUIDON DESIGN
905 N. CAPITOL AVE. SUITE 100
INDIANAPOLIS, IN. 46204
317.800.6388

Mech & Plumb Engineer	Elec Engineer	Civil Engineer	Functional Design
APOGEE CONSULTING GROUP, PA	CMTA CONSULTING ENGINEERS	H2B Inc..	CARL WALKER INC.
1151 Kildare Farm Road, Suite 120, Cary, NC 27511	1610 Woodstead Court, Suite 105 Woodlands, TX 77380	1225 North Loop West,Suite 900 Houston, TX 77008	2801 Network Blvd., Suite 101 Frisco, TX 75034
T: 919.858.7420	T: 281.419.9899	T: 713.864.2900	T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

Drawing Title: LEVEL 4 - PLUMBING PLAN
Project Title: BUILD PARKING GARAGE A
Apogee Project #: 14-188
Building Number: 123
OFFICE OF FACILITIES MANAGEMENT
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER
Location: Michael E. DeBakey VAMC, Houston, TX
Date: 2015/10/16
Checked By: DJR
Drawn By: ORD
Drawing Number: PP104
VA Project Number: 580-321
U.S. Department of Veterans Affairs

C:\Users\oruizdiaz\Documents\14-188-Mech-Plumb_oruizdiaz.rvt

LEADER SIZING CALCULATION

GARAGE DIMENSIONS:

LENGTH = 310 FT
WIDTH = 124 FT
HEIGHT/LEVEL = 11'-4"
PARAPET WALL OR OPEN HEIGHT PER LEVEL = 4'-6"

AREA A = 5036 FT²
AREA B = 4426 FT²
AREA C = 4426 FT²
AREA D = 4825 FT²
AREA E = 4331 FT²
AREA F = 3344 FT²
RAMP AREA = 10957 FT²
ELEV/STAIR = 388
STAIR = 248

LEADER 1 (AREAS A+E+ELEV/STAIR+RAMP) : 10"ø

EQUIVALENT AREA PER LEADER:
LEVEL 4 9756 FT²
LEVEL 3 : 11658 FT²
LEVEL 2 : 700 FT²
LEVEL 1 : 700 FT²
TOTAL: 22814 FT²

LEADER 2 (AREA B): 8"ø

EQUIVALENT AREA PER LEADER:
LEVEL 4 4426 FT²
LEVEL 3 : 350 FT²
LEVEL 2 : 350 FT²
LEVEL 1 : 350 FT²
TOTAL: 5476 FT²

LEADER 3 (AREA C): 8"ø

EQUIVALENT AREA PER LEADER:
LEVEL 4 4426 FT²
LEVEL 3 : 350 FT²
LEVEL 2 : 350 FT²
LEVEL 1 : 350 FT²
TOTAL: 5476 FT²

LEADER 4 (AREAS D+F+STAIR): 8"ø

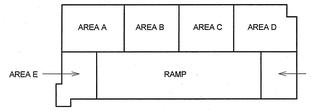
EQUIVALENT AREA PER LEADER:
LEVEL 4 8417 FT²
LEVEL 3 : 700 FT²
LEVEL 2 : 700 FT²
LEVEL 1 : 700 FT²
TOTAL: 10517 FT²

HOUSTON, TEXAS 100 YEAR 60 MIN. PRECIPITATION: 4.6 IN

HORIZONTAL LEADER CAPACITY - TABLE 1106.3 (1% SLOPE):
6" @ 4.6"/HR = 4922 FT²
8" @ 4.6"/HR = 10580 FT²
10" @ 4.6"/HR = 19052 FT²
12" @ 4.6"/HR = 30640 FT²
15" @ 4.6"/HR = 54740FT²

HORIZONTAL LEADER CAPACITY - TABLE 1106.3 (2% SLOPE):
15" @ 4.6"/HR = 77300 FT²

VERTICAL LEADER CAPACITY - TABLE 1106.2(1):
8"ø @ 4.6"/HR = 26680 FT²
6"ø @ 4.6"/HR = 12420 FT²



WALL HYDRANT PRESSURE CALCULATION

STARTING POINT
80 PSI

PRESSURE DROP USED = 3 PSI/100'

LONGEST RUN = 100.00'
EQUIVALENT P.D. 3.0 PSI

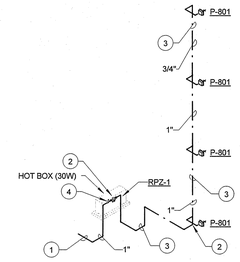
HIGHEST FIXTURE = 40'
EQUIVALENT P.D. = 17.24 PSI

RPZ P.D.
12 PSI

TOTAL P.D.
3 PSI + 17.24 PSI + 12 PSI = 32.24 PSI

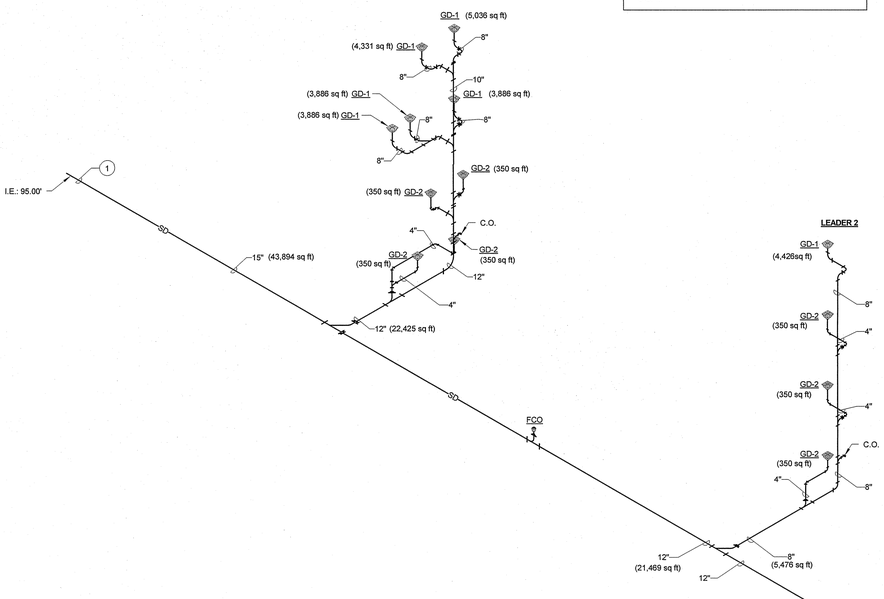
PRESSURE AT HIGHEST FIXTURE
80 PSI - 32.24 PSI = 47.76 PSI

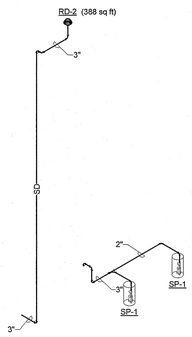
FLOW AT HIGHEST FIXTURE
5 GPM



2 PP301 DOMESTIC WATER ISOMETRIC

KEY	NOTE
1	REFER TO CU101 FOR CONTINUATION
2	PROVIDE DRAIN VALVE DOWNSTREAM OF RPZ AND AT WATER RISER LOWEST POINT TO DRAIN THE SYSTEM IF NEEDED.
3	HEAT TRACE EXPOSED DOMESTIC WATER PIPE.
4	PROVIDE PRV AND SET TO 80 PSI.





3 PP301 STAIR TOWER AND ELEVATOR SUMP ISOMETRIC

1 PP301 MAIN GARAGE STORM DRAINAGE ISOMETRIC

C:\Users\orudiaz\Documents\14-188-Mech-Plumb_orudiaz.rvt

Revisions:	Date

VA | U.S. Department of Veterans Affairs
Michael E. DeBakey VAMC
2002 Holcombe BLVD, Houston TX 77030

ARCHITECT/ENGINEERS:

PROJECT LEAD Architect, Structural Engineer	Mech & Plumb Engineer	Elec Engineer	Civil Engineer	Functional Design
GUIDON DESIGN	APOGEE CONSULTING GROUP, PA	CMTA CONSULTING ENGINEERS	H2B Inc..	CARL WALKER INC.
905 N. CAPITOL AVE. SUITE 100 INDIANAPOLIS, IN. 46204 317.600.6388	1151 Kildare Farm Road, Suite 120, Cary, NC 27511 T: 919.858.7420	1610 Woodstead Court, Suite 105 Woodlands, TX 77380 T: 281.419.9899	1225 North Loop West,Suite 900 Houston, TX 77008 T: 713.864.2900	2801 Network Blvd., Suite 101 Frisco, TX 75034 T: 469.777.5143

100% CONSTRUCTION DOCUMENTS

Drawing Title: STORM DRAINAGE AND DOMESTIC WATER ISOMETRIC	Project Title: BUILD PARKING GARAGE A	Apogee Project #: 14-188	OFFICE OF FACILITIES MANAGEMENT
		Building Number: 123	
Approved for Design Concept: FACILITY MANAGEMENT DIVISION MANAGER	Location: Michael E. DeBakey VAMC, Houston, TX	Drawing Number: PP301	VA Project Number: 580-321
	Date: 2015/10/16 — Checked By: DJR — Drawn By: ORD		VA | U.S. Department of Veterans Affairs